



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 20022150 WO		FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI 2003/000898	International filing date (day/month/year) 24.11.2003	Priority date (day/month/year) 05.12.2002	
International Patent Classification (IPC) or national classification and IPC C22B 7/04			
Applicant Outokumpu Oyj et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand 16.06.2004	Date of completion of this report 09.03.2005
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Mårten Hulthén/MP Telephone No. +46 8 782 25 00

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1 - 5 _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 7 - 8 _____ received by this Authority on 22.10.2004

pages* _____ received by this Authority on _____

☒ the drawings:

pages 1 _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-10</u>	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	<u>1-10</u>	NO
Industrial applicability (IA)	Claims	<u>1-10</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Amended claims 1-10 were filed on 27.10-2004

Claim 1 has been amended in a manner that it contains the restriction that the dissolved copper is precipitated before returning it to the smelting process. Document US 3632308 has, therefore, been reconsidered not to be of particular relevance.

Documents cited as being of particular relevance:

D1 DE 2348005

D2 WO0149890

D2 (e.g. figure 2) discloses a method according to the preamble of claim 1. The method of claim 1 of the application differs from D2 in that copper is precipitated as defined in the characterizing part of the claim. The invention provides an alternative solution for copper recovery from the slag that is created in the process. A person who has knowledge of D2 and seeks an alternative solution would look into other processes where copper is recovered from slag.

D1 (claims 2-3) discloses the leaching of slag (page 3, 4th paragraph), dissolution of copper and precipitating of the copper. The process has a general application (page 1, 1st paragraph) for the recovery of copper from slag or similar materials obtained in different processes.

It is considered to be obvious to a person skilled in the art to use the knowledge from D1 in the process revealed by D2 in order to arrive at a method defined by claim 1 of the application. Consequently, claim 1 lacks an inventive step.

The dependent claims 2-10 define embodiments that are not considered to involve an inventive step in regard to the cited documents.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International Application No.

PCT/FI 2003/000898

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 9 does not refer to precipitation and therefore can no longer be subordinated to claim 1 (PCT Rule 6.4 (a) and (b)).

CLAIMS

1. A method for recovering copper from slag created in the production of blister copper processed directly from concentrate in a suspension smelting furnace, such as a flash smelting furnace, **characterized** in that at least part of the slag is leached in at least one step to dissolve copper of the slag, the dissolved copper is precipitated and the precipitated copper is returned to the smelting process.
2. A method according to claim 1, **characterized** in that the slag is granulated and ground before leaching.
3. A method according to claim 1 or 2, **characterized** in that the leaching is carried out with sulfuric acid.
4. A method according to claim 1 or 2, **characterized** in that the leaching is carried out with an ammoniacal solution.
5. A method according to claim 1 or 2, **characterized** in that the leaching is carried out with a chloridic solution.
6. A method according to claim 1 or 2, **characterized** in that the leaching is carried out as a bacteria solution.
7. A method according to any of the preceding claims, **characterized** in that after leaching, the copper is recovered by hydroxide precipitation.
8. A method according to claim 1 – 6, **characterized** in that after leaching, the copper is recovered by sulfide precipitation.
9. A method according to claim 1 – 6, **characterized** in that after leaching, the copper is recovered in liquid-liquid extraction and electrolysis as cathode copper.

10. A method according to claim 7 or 8, **characterized** in that the copper-bearing slag created in precipitation is conducted back into the suspension smelting furnace.

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